Claims:

[c1] (Currently amended) A method for dense and secure transmission of signals and information using a small number of channels, the method comprising

a) choosing an appropriate integer modulus m, positive integer n, corresponding to the number of bits to be ~~encoding~~ encoded, and generating n x n matrix A with integer elements where the diagonal elements of A differs modulo m from all the other elements of their column, and where A can be written as matrix-product BC where B is an n x t matrix, C is a t x n matrix, where t is less than n;
b) encoding the length-n vector x to the length-t vector xB, by vector-matrix product modulo m;
c) transmitting the coordinates of the length-t vector xB on t channels;
d) retrieving the coordinates of the vector by computing xBC=xA by vector-matrix product modulo m;
e) for every coordinate of vector xBC=xA, filtering out the terms added as the linear combination of other coordinates of vector x.

[c2] (Previously presented) A method according to claim 1, wherein the modulus m is non-prime-power composite positive integer, the diagonal elements of matrix A are non-zero modulo any prime-divisors of m, and each non-diagonal elements of matrix A are zero modulo for at least one prime divisor of m.

[c3] (Currently amended) A method according to claim 2, wherein the filtering step for retrieving the original values of the transmitted 0-1 vector further comprising:

a) periodical change of the values of the coordinates of vector x with original value equal to 1 on values 0,1,2,...,m-1 in this order, and on values of m-1,m-2,...,3,2,1,0 in this order of the coordinates of vector x with original value equal to 0;
b) measuring the periodicity of each coordinates of vector xBC=xA;
c) if a coordinate has period less than m then it is to be neglected;
d) if a coordinate has period equal to m, and it changes its values as 0,1,2,...,m-1, then its original value was 1;
e) if a coordinate has a period equal to m, and it changes its values as m-1,m-2,...,3,2,1,0, then its original value was 0.

[c4] (Previously presented) A method, according to claim 3, wherein the periodic change of the discrete values of the coordinates of vector x are approximated by continuous wave forms of electronic, magnetic or optical signals.

[c5] (Currently amended) A method, according to claim 1, wherein ~~between the communicating nodes~~ two transmission networks are constructed between nodes R_1, R_2, ...,R_n and S_1,S_2, ...,S_n ~~two networks are constructed~~, each node may send or receive a coordinate of a length-n vector; in the first network nodes S_1,S_2, ...,S_n play the role of the senders of coordinates of vector x and R_1, R_2,...,R_n play the role of the receivers; they receive the coordinates of xBC=xA, and in the second network R_1, R_2,...,R_n play the role of the senders of coordinates of vector x, and S_1, S_2,...,S_n play the role of the receivers, they receive the coordinates of xBC=xA.

[c6] (Currently amended) A method, according to claim 1, wherein the filtering step for retrieving the original values of the transmitted 0-1 vector further comprising:

a) change of the values of the coordinates of vector x with original value equal to 1 to value 0, and the coordinates of vector x with original value equal to 0 to 1;
b) measuring the change of each coordinates of vector xBC=xA;
c) if the change in the value of in coordinate i ~~(where integer i is between 1 and n)~~ is not the ith diagonal element of matrix A modulo m or not (-1)-times the ith diagonal element of matrix A modulo m, then the change is neglected;
d) if the change in the value in coordinate i ~~(where integer i is between 1 and n)~~ is the ith diagonal element of matrix A modulo m then original value was 0;
e) if the change in the value in coordinate i ~~(where integer i is between 1 and n)~~ is (-1)-times the ith diagonal element of matrix A modulo m then original value was 1.